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ABSTRACT

The preparation of spelling skills indices, which may be used to describe the spelling content commonly taught in textbooks and the performance modes used to practice this content, is outlined in this paper. Separate sections discuss the preliminary analysis that was performed; the establishment of a Content Index that specifies major categories and subcategories of spelling content; the derivation of a Performance Mode Index to describe performance modes appearing in textbook exercises; the coding of the instructional exercises in eight commercial spelling series; and the computer-assisted development of a list of all spelling words taught. Appendixes present the Content and Performance Mode Indexes, a list of the spelling series used for coding, and a sample page of the computer printout of spelling vocabulary. (GT)

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PROFICIENCY VERIFICATION SYSTEMS (PVS): SKILLS INDICES FOR SPELLING

Bruce Cronnell

ABSTRACT

Spelling skills indices have been prepared to describe the spelling content that is commonly taught in textbooks, as well as the performance modes used to practice this content. These skills indices are used for coding elementary school textbooks in order to determine and to assess what is actually being taught.

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PROFICIENCY VERIFICATION SYSTEM (PVS): SKILLS INDICES FOR SPELLING*

Bruce Cronnell

Proficiency Verification Systems (PVS) are assessment systems that are closely tied to the actual instruction presented in textbooks at a given grade level (Buchanan, 1975). Earlier PVS work has covered mathematics and reading (Buchanan and Milazzo, 1977; Fiege-Kollmann, 1977). The present paper describes initial work on spelling in elementary school textbooks.

Preliminary Analysis

The first step was a preliminary analysis of several commercial spelling series that were on hand in the SWRL library. This review of content, supplemented by a review of Cronnell (1971), suggested the major features of spelling content and skills found in current spelling instruction. This analysis indicated that most of what is found in current instruction is also found in the SWRL Spelling Program. Thus, to make specification of content and skills easier, the SWRL Spelling Program was used as the basis for specifying the Content Index and the Performance Mode Index. The information from the preliminary review was also used to provide for content and performance modes not found in the SWRL Spelling Program.

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*Ann Humes provided considerable assistance in the development of these skills indices.

Content Index

The Content Index (Appendix A) was derived from Russell (1975), which is a thorough description of the English spelling system. This description was changed somewhat to rewrite spelling rules to better reflect actual instructional rules and to eliminate low frequency spelling rules that would rarely (if ever) occur in actual spelling instruction. Twenty-nine major categories of spelling content were established; these categories receive three-digit codes (coded as "Major Skill Area").*

Consonants
- Invariable single consonants
- Variable consonants
- Consonant digraphs
- Miscellaneous doubled consonants
- Miscellaneous silent consonants

Vowels
- Short vowels
- Long vowels
- Vowel-r

Affixation
- Inflectional suffixes
- Derivational suffixes and endings
- Endings
- Prefixes and beginnings
- Affixation processes

Structures
- Dictionary skills
- Homophones

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*See Appendix C for a sample coding sheet.

Compounds
Irregular words
Contractions
Abbreviations
Syllabication
Special sets of words
Segments
Whole words

Non-spelling

Miscellaneous

Several features should be noted about the above listing. Non-spelling categories were included because non-spelling activities (e.g., handwriting, grammar) occur in many textbook series. Some questionable spelling categories (e.g., syllabication, miscellaneous silent consonants) were included because they also occur in many series. In addition, the organization of the major categories was in part determined by current PVS computer programming. If a theoretically appropriate major category (e.g., suffixes and endings) had more subcategories than allowed by the system, it was divided into suitable new major categories. However, this decision presently available programming rather than require new programming does not have a serious effect on either coding or analysis.

Within each major category are up to 50 subcategories that define spelling content more precisely. The first 44-45 subcategories (coded as the first "Focus") are mutually exclusive; the last 5-6 (coded as the second "Focus") can be used, when appropriate, in conjunction with the preceding categories to delineate specific uses. In most major

categories, an "Other" code was established, permitting coverage of unspecified low frequency spellings.

Performance Mode Index

The Performance Mode Index (Appendix B) was derived from Humes (1976), which describes the instructional specifications for the SWRL Spelling Program. The performance modes were numbered 51-99 so that they could be used in conjunction with all of the 50 subcategories described in the preceding paragraph. Performance modes numbered 51-60 (coded as the third "Focus") are verbs describing the motor skills involved in the exercise task. Performance modes numbered 61-99 (coded as the fourth "Focus") are noun phrases (i.e., direct objects of the verbs) describing the stimulus and response characteristics of the exercise task. Together the verbs and the noun phrases form directions for performing exercise tasks. The verbs and noun phrases can be combined in many ways to describe a variety of performance modes appearing in textbook exercises.

Coding

Eight commercial series (see Appendix D) were selected for initial coding.

Each instructional exercise is coded for a major content category. When (as is usually the case) specific content is being practiced, at least one subcategory code is also used. When the "Other" code is used, prose explanation is added (under "Description"). Then two Performance Mode codes are used--one verb and one noun phrase--to

describe the task to be performed by the student. When a peculiar task (or especially a peculiar noun phrase) is used, it is added in prose.

Performance modes are coded according to what the student actually has to do, not necessarily what the textbook directions state. For example, textbooks often say "write," but the student task may be some kind of copying task. The code for "Write" (number 58) is used only when students are expected to generate spellings on their own. Since most series (but not the SWRL Spelling Program) print the spelling words on the exercise page and since many exercises cannot be completed without reference to the list of specific words, the codes for "Choose and write" (number 57), "Copy" (number 59), or "Write/Copy" (number 60) may be more commonly used than "Write."

Spelling Vocabulary

Specific words must be used to develop PVS assessment instruments in spelling. When spellings are taught as rule-based, then any word conforming to the rule can be used. When spellings are taught as irregular (whether or not they are in fact irregular), then specific, taught words must be used. A computer program has been prepared to provide a list of all taught words (Simpkins, 1978). The input for this program is the following:

1. word
2. series number
3. grade level (Block number for the SWRL Spelling Program)
4. unit

5. codes for irregular words and homophones if taught as such

The output from this program is an alphabetized set of words from all programs. Across the printout page are columns for the various series; under each column is the appropriate information from 3-5 above if that word is included in the series as a specifically taught word. A sample of this output is found in Appendix E.

References

Buchanan, A. Proficiency Verification Systems (PVS) (Technical Note No. 3-75-07). Los Alamitos, Calif.: SWRL Educational Research and Development, 1975.

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Cronnell, B. Beginning spelling: A linguistic review of six spelling series (Technical Report No. 35). Los Alamitos, Calif.: SWRL Educational Research and Development, 1971.

Fiege-Kollmann, L. Proficiency Verification Systems (PVS): Index of Reading Skills (Technical Note No. 3-77-01). Los Alamitos, Calif.: SWRL Educational Research and Development, 1977.

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Simpkins, W. "The PVS Spelling Vocabulary Comparison Procedure" (Memo to B. Cronnell). Los Alamitos, Calif.: SWRL Educational Research and Development, March 16, 1978.

Appendix A
PVS Spelling
Content Index

010 Consonants

45 initially
46 medially
47 finally

011 Invariable single consonants

01 /b/ → b
02 /d/ → d
03 /g/ → g
04 /h/ → h
05 /p/ → p
06 /t/ → t
07 /w/ → w
08 /ks/ → x
09 /y/ → y
10 clusters
11 /C/ → CC /V__V
12 /C/ → C /V__V

45 initially
46 medially
47 finally
[no code: mixed positions]
49 not explicitly taught
50 other spelling [indicate]

013 Consonant digraphs [Indicate environment where relevant and whether or not taught.]

01 /ch/
02 /ch/ → ch
03 /ch/ → tch
04 /ng/
05 /ng/ → ng
06 /ng/ → n
07 /sh/
08 /sh/ → sh
09 /sh/ → ch
10 /th/, /TH/ → th
11 /hw/ → wh

45 initially
46 medially
47 finally
48 environment taught
49 environment not taught
50 other spelling [indicate]

014 Miscellaneous doubled consonants

015 Miscellaneous silent consonants

012 Variable consonants [indicate environment where relevant and whether or not taught.]

01 /f/
02 /f/ → f
03 /f/ → ff
04 /f/ → ph
05 /j/
06 /j/ → j
07 /j/ → g
08 /j/ → ge
09 /j/ → dge
10 /j/ → dg
11 /k/
12 /k/ → k
13 /k/ → c
14 /k/ → ck
15 /k/ → ch
16 /kw/ → qu
17 /l/
18 /l/ → l
19 /l/ → ll
20 /m/
21 /m/ → m
22 /m/ → mb
23 /n/
24 /n/ → n
25 /n/ → kn
26 /r/
27 /r/ → r
28 /r/ → wr
29 /s/
30 /s/ → s
31 /s/ → ss
32 /s/ → c
33 /s/ → sc
34 /s/ → st
35 /s/ → se
36 /s/ → ce
37 /v/
38 /v/ → v
39 /v/ → ve
40 /z/
41 /z/ → z
42 /z/ → s
43 /z/ → se
44 /z/ → ze

45 initially
46 medially
47 finally
[no code: mixed positions]
48 environment taught
49 environment not taught
50 other spelling [indicate]

020 Vowels

45 initially
46 medially
47 finally

021 Short vowels [Indicate environment where relevant and whether or not taught.]

01 /a/ → a
02 /a/
03 /e/ → e
04 /e/ → ea
05 /i/
06 /i/ → i
07 /i/ → y
08 /o/ → o
09 /ô/
10 /ô/ → o
11 /ô/ → a
12 /ô/ → au
13 /ô/ → augh
14 /ô/ → aw
15 /ô/ → ough
16 /u/
17 /u/ → u
18 /u/ → o
19 /u/ → o...e
20 /u/ → ou
21 /ù/
22 /ù/ → u
23 /ù/ → oo
24 /ə/ [not in affix]

45 initially
46 medially
47 finally
48 environment taught
49 environment not taught
50 other spelling [indicate]

022 Long vowels [Indicate environment where relevant and whether or not taught.]

01 /ā/
02 /ā/ → a
03 /ā/ → a...e
04 /ā/ → ai
05 /ā/ → ay
06 /ā/ → ei
07 /ā/ → eigh
08 /ā/ → ey
09 /ē/
10 /ē/ → e
11 /ē/ → e...e
12 /ē/ → ea
13 /ē/ → ee
14 /ē/ → i
15 /ē/ → ie [not suffix/ending]
16 /ī/
17 /ī/ → i
18 /ī/ → i...e
19 /ī/ → ie
20 /ī/ → igh
21 /ī/ → y
22 /ī/ → y...e
23 /ō/
24 /ō/ → o
25 /ō/ → o...e
26 /ō/ → oa
27 /ō/ → oe
28 /ō/ → ou
29 /ō/ → ow
30 /(y)ū/
31 /(y)ū/ → u
32 /(y)ū/ → u...e
33 /(y)ū/ → eu
34 /(y)ū/ → ew
35 /(y)ū/ → oo
36 /(y)ū/ → ou
37 /(y)ū/ → ue
38 /(y)ū/ → ui
39 /oi/
40 /oi/ → oi
41 /oi/ → oy
42 /ou/
43 /ou/ → ou
44 /ou/ → ow

45 initially
46 medially
47 finally
48 environment taught
49 environment not taught
50 other spelling [indicate]

023 Vowel-r [Indicate environment where relevant and whether or not taught.]

01 /ər/ → ar
02 /er/ [if treated separately from /ār/]
03 /er/ → are
04 /er/ → air
05 /er/ → ear
06 /ēr/
07 /ēr/ → er
08 /ēr/ → ir
09 /ōr/ → ur
10 /ēr/ → ear
11 /ēr/ → or
12 /ir/ [if treated separately from /ēr/]
13 /ir/ → ear
14 /ir/ → eer
15 /ir/ → ere
16 /ȳr/ [if treated separately]
17 /ôr/ [if treated separately from /ōr/]
18 /ôr/ → or
19 /ôr/ → ore
20 /ôr/ → oar
21 /ôr/ → our
22 /ôr/ → ar
23 /(y)ůr/ → [if treated separately from /(y)ūr/]
24 /ůr/ → oor
25 /(y)ůr/ → ure

45 initially
46 medially
47 finally
[no code: mixed positions]
48 environment taught
49 environment not taught
50 other spelling [indicate]

030 Affixation

031 Inflectional suffixes

01 -s
02 -es [Indicate after what spellings]
03 -ed
04 -ing
05 -er
06 -er comparative
07 -er agentive
08 -or
09 -est
10 -en
11 possessives
12 possessive 's
13 possessive s'

44 base words
46 also with bound bases
49 only with bound base

50 other [indicate]

032 Derivational suffixes and endings [R&C: fz18]

01 -able
02 -age
03 -ain
04 -al
05 -an
06 -ance
07 -ant
08 -ar
09 -ard
10 -ary [indicate pronunciation]
11 -ate [indicate pronunciation]
12 -ence
13 -ent
14 -ern
15 -ery
16 -ful
17 -ible
18 -ic
19 -ice
20 -ie
21 -ify
22 -ine
23 -ion
24 -ish
25 -ist
26 -ity
27 -ive
28 -ize
29 -less
30 -ly
31 -ment
32 -ness
33 -ory
34 -ous
35 -teen
36 -th
37 -ty
38 -ure
39 -ute
40 -ward
41 -y

44 base words
45 free bases
46 bound bases
47 free and bound bases
48 with palatalization
50 other [indicate]

033 Endings

01 el
02 et
03 is
04 id
05 il
06 in
07 is
08 it
09 le
10 om
11 on
12 um
13 us

45 also with free bases

50 other

034 Prefixes and beginnings

01 a-
02 ad-
03 be-
04 con-
05 de-
06 dis-
07 e-
08 en-
09 ex-
10 in-
11 in- ("inside")
12 in- ("not")
13 inter-
14 mis-
15 ob-
16 per-
17 pre-
18 pro-
19 re-
20 se-
21 sub-
22 trans-
23 un-
24 al-

44 base words
45 free bases
46 bound bases
47 free and bound bases
48 with partial assimilation
49 with full assimilation [includes partial]
50 other

035 Affixation processes [Indicate affix with which process is used, if so limited.]

- 01 final e
- 02 e dropped [Indicate if treated as as loss of e in suffix; e.g., ED-D.]
- 03 e /__C
- 04 e /c, g __
- 06 final y
- 07 y to i
- 08 y / __i
- 10 y /V__
- 11 y dropped
- 12 doubling
- 13 doubling in one-syllable words
- 14 doubling in two-syllable words
- 15 non-doubling in one syllable words
- 16 non-doubling in two-syllable words
- 17 ie to y
- 18 f(e) to ves
- 19 le to ul
- 20 le to il
- 21 palatalization
- 22 t /sh/ /__i
- 23 ss /sh/
- 24 st /sch/
- 25 s /zh/
- 26 c /sh/
- 27 t /ch/ /__u
- 28 g /j/
- 29 d /j/
- 30 partial assimilation [indicate]
- 31 full assimilation [indicate; includes partial]
- 44 base words
- 50 other

040 Structures

041 Dictionary skills

- 01 alphabetical order
- 02 alphabetize by first letter
- 03 alphabetize by second letter
- 04 alphabetize by third letter
- 05 alphabetize by fourth or higher letter
- 06 guide words
- 07 pronunciation symbols
- 50 other

042 Homophones [when not with specific spelling; indicate]

043 Compounds

- 01 hyphenated only
- 10 e retention
- 11 y retention

044 Irregular words [indicate]

- 49 not taught as irregular

045 Contractions

- 01 for be
- 02 for have
- 03 n't
- 04 'll
- 05 other [indicate]

046 Abbreviations [indicate]

047 Syllabication

- 01 C_1/C_1
- 02 C_1/C_2
- 03 V/CV
- 04 VC/V
- 05 compounds
- 06 other [indicate]

048 Special sets of words

- 01 days
- 02 holidays
- 03 months
- 04 numbers
- 50 other [indicate]

049 Segments

- 01 final VC
- 02 final VCC
- 03 initial CV
- 04 final VCE
- 50 various positions

050 Whole words, using taught spellings [Higher numbers include lower numbers, use only when nothing else fits.]

- 01 CVC (/CVC/)
- 02 (C)CVC(C) (C=/C/ or /CC/)
- 03 (C)VCe
- 04 two syllables

900 Non-spelling [indicate; generally no performance mode, only description.]

- 01 Handwriting
- 02 Composition
- 03 Reading
- 04 Etymology
- 05 Grammar
- 06 Punctuation
- 07 Capitalization
- 50 other

999 Miscellaneous [indicate]

Appendix B

PVS Spelling

Performance Mode Index

Motor skill

51 Circle [or Draw line around - indicate: "(line)"]
52 Underline
53 Draw line between
54 Mark [indicate if not X]
55 Yes/No
56 Fill in [Write part of word or sequence; may require writing of whole word or sequence]
57 Choose and write
58 Write [= "correct" for 94 and 95]
59 Copy
60 Write/Copy

Response

Visual discrimination

61 words
62 same segment in isolation
63 same segment in words
64 segment(s) same as sample in isolation
65 segment(s) same as sample in words
66 segment(s)
67 word(s) with segment

Aural discrimination

69 rhyme(s) [Indicate picture or word]
70 picture(s) with same sound
71 word(s) with same sound
[Indicate if matching to stimulus: "as picture" or "as word".]
74 picture(s) with specified sound
75 word(s) with specified sound
76 letter(s) for specified sound

Spelling sounds

77 words from pictured first sounds
78 letter(s) for oral stimulus
79 letter(s) for picture
80 letter(s) for pronunciation symbol(s)

Spelling words

81 homophone that completes sentence
82 word that means...
[Indicate when appropriate.]
83 word for oral stimulus
84 letters and then word for oral stimulus
85 word for picture
86 letters and then word for picture
87 homophone for picture
88 homophone for word
89 word for picture and then homophone
[Indicate when appropriate.]
90 word that completes sentence
91 word that rhymes [Indicate "with word" or "with picture."]
92 word that is opposite
93 word from pronunciation symbols
94 identified misspelled word
95 unidentified misspelled word
96 segments together
97 affixed word in sentence - root given
98 crossword puzzle
99 word that is synonym

Appendix C

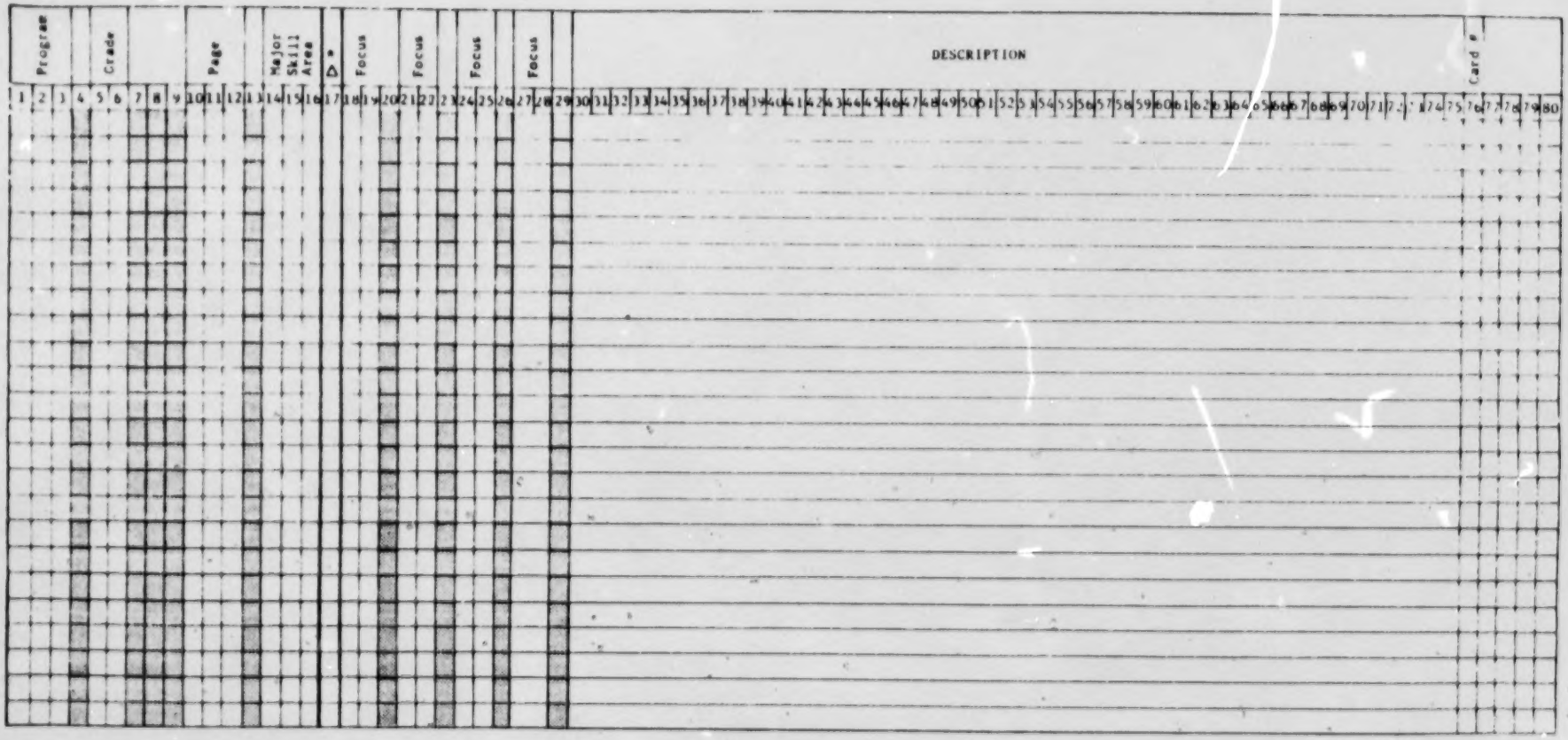
PVS Coding Sheet

PROGRAM NAME: _____

GRADE: _____ LEVEL _____

WORK UNIT _____

PAGE _____ OF _____



Appendix D

Spelling Series for PVS Coding

Benthul, H. F., Anderson, E. A., Utech, A. M., & Biggy, M. V. Spell Correctly. Morristown, NJ: Silver Burdett, 1971. (Only cosmetically different from a more recent edition.) (Series 001)

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SWRL. Communication Skills Programs: Spelling. Lexington, MA: Ginn, 1975. (Referred to as the SWRL Spelling Program.) (Series 003)

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Appendix E

Sample Page of Vocabulary Printout

SOUTHWEST REGIONAL LABORATORY
EDUCATIONAL RESEARCH AND DEVELOPMENT
PROFICIENCY VERIFICATION SYSTEM
VOCABULARY COMPARISON FOR SPELLING
PAGE 1

WORD	SERIES	1	2	3	4	5	6	7
A		02 06	01 01 I	02 6 I	01 94		01 38 I	01 02 I
ABLE		03 28				03 28		
ABOARD		03 35						
ABOUT		02 32		08 2	02 26	03 33	02 26	
ABOVE		02 34		08 2		03 33 I		
ACROSS				08 2	03 22		03 17	03 04 I
ACT								03 39
ACTED								03 39
ADD				08 5 IH		03 02		02 17
ADDRESS						03 36		03 03
AFAR		03 35						
AFRAID				08 5	03 34		03 08	
AFTER		02 28	03 07	07 1	02 28	02 33	02 23	02 29 I
AFTERNOON		03 32	03 17		02 25		03 24	
AGAIN		03 35		08 2	03 17	03 33 I	02 34 I	03 14 I
AGAINST		03 35		08 2				
AGE			02 23	06 3		03 11		03 09
AGO		03 35		08 2	03 15	03 33	03 06	03 13
AHEAD				08 2	03 35	03 33 I		
AID								03 14
AIM						03 06		
AIR		02 29		05 6	03 31	02 29		03 21
AIRCRAFT		03 25						
AIRLINE		03 20						
AIRMAIL		03 25						
AIRPLANE		03 20			03 31		02 30	
AIRPORT		03 20						
ALARM						03 33		
ALASKA		03 35						
ALIKE						03 33		
ALIVE						03 33		
ALL		02 33	03 08	05 1	02 19	02 25	01 70 I	02 33
ALMOST			03 09	08 4		03 32	03 04	
ALONE			03 09	08 2		03 33	03 14	03 27
ALONG		03 22			03 35	03 33	03 20	03 14 I
ALREADY			03 09	08 4			03 15	
ALSO		03 23	03 09	08 4	03 15	03 32	03 08	03 27
ALTHOUGH							03 32	
ALTOGETHER			03 09					
ALWAYS		03 23	03 09	08 4	03 34	03 32	03 04	
AM		02 02	01 02	02 6	02 35	01 18	01 52	01 02 I
AMAZE		03 36						
AMERICA		03 35						
AMONG				08 2		03 33 I		
AMUSE		03 16						
AN		02 06	01 06		02 08		01 52	02 04
AND		02 18	01 24	03 6	02 25		01 36 I	01 03 I
ANGRY						03 25		
ANIMAL							02 10	
ANIMALS					03 08			